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Sustainable Dietary Solutions to a Multi-Dimensional Epidemic: A Practical Application of the Mediterranean Diet to Nebraska

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SUSTAINABLE DIETARY SOLUTIONS TO A MULTI-DIMENSIONAL EPIDEMIC: A PRACTICAL APPLICATION OF THE MEDITERRANEAN DIET TO NEBRASKA

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Abstract

There is substantial evidence to suggest the major health and environmental benefits of the Mediterranean diet. When compared to the Western Pattern diet, the Mediterranean diet consistently ranks higher by both of these measures. Considering a looming environmental crisis and an already present health epidemic, a major dietary shift and overhaul of the current food system in America is necessary. Yet few studies aim to suggest the transferability of the Mediterranean diet to regions outside of the Mediterranean basin. Nebraska offers a unique case study as it reflects the contextually poor health of Americans and boasts a massive agriculture industry supported by diverse geographical features. The following study aims to compare the two diets from a health and environmental lens and identify transferrable components to be applied in Nebraska.

Introduction

Only recently has the topic of food taken a legitimate role in the conversation of sustainability as the world continues the debate on climate change. The notion of a sustainable diet has both challenged and perplexed researchers for decades. However, the culmination of numerous bodies of research across many spectrums has created a genre of study that now offers a number of solutions. Sustainable diets are currently looked to as points of emphasis for environmental, health, economic, and other focal benefits.

Many countries have adopted the practice of incorporating sustainability into their dietary guidelines and measures. Critics disregard the network of connections for many reasons, though the fact remains that human dietary patterns, as outlined by agricultural practices, are intimately connected with the natural environment. Humans have the potential to change natural processes from local ecosystems to global climate, largely impacted by food.

Human dietary patterns have mostly existed in relation to geographic location for the entirety of human existence up until the past century when a western lifestyle began to take form [3]. Up until this point the notion of a sustainable diet would have received constant critique as communities had always received their food from their local ecosystems. With the globalization of the western lifestyle a new diet took over the United States and continues to spread today [3, 21].

The Western Pattern Diet, WPD, is distinct in its high consumption of red meats, processed foods, refined sugars, high-fat, and minimal intake of fruits and vegetables [21]. This lifestyle change took control in the twentieth-century and its global impact was quickly recognized. The popularization and international spread are due in part to the incorporation of a food system that stems from the American industrial revolution. Countries with deep food

traditions steeped in rich history are witnessing the takeover of the WPD, although many efforts to preserve and protect local habits are in place. Despite numerous studies citing the significant health and environmental detriments of a WPD, it continues to be a driving force in the dietary patterns of Americans and increasingly many populations around the globe [3, 9, 15, 21].

The Mediterranean diet, MD, is a dietary pattern that stems from the traditional diets historically relevant to the Mediterranean basin up until the middle of the twentieth century, when the western diet began its globalization. The MD has been a topic of rigorous study throughout many professional communities due to its nutrition and health benefits, low environmental impact, deep cultural values, and local economic impact [4]. Numerous studies point towards major health benefits, including but not limited to the reduction in chronic diseases, cardiovascular disease, type 2 diabetes, and cognitive impairment [1, 2, 4]. Further, recent analyses have focused on the MD's use as a model of sustainability. The nature of the diet promotes biodiversity, lowers meat consumption, and acts seasonally, all resulting in a lower environmental impact in comparison to other popular diets [2, 4, 15]. However, few studies aim to produce a sensible function of transferability to regions outside of the Mediterranean basin.

In this study, a practical application of the Mediterranean Diet to Nebraska is presented in order to address the multidimensional problem of a changing global climate and a major health crisis. Objectives and questions must be specified in order to identify key solutions. First, the two diets need to be described so to establish the main differences between them. This will form a basis for comparing and contrasting the environmental and health benefits and detriments. Given the current status of Nebraska (i.e. population, geography, climate, agriculture, etc.), transferable components of the MD can be identified to implement in the state. Finally, tangent studies can be suggested to expand upon the currently limited network of research involving this topic.

Ultimately, the goal is to open a discussion about a sustainable food system and to catalyze positive change towards a healthier, more environmentally friendly future.

The MD is a model of sustainability as it promotes health and nutrition, environmental friendliness, cultural values, and local economic stimulation. A true sustainable diet takes into account multiple aspects of its impact, as outlined by the MD. The Food and Agriculture Organization of the United Nations convened with constituent governments at a 2010 consortium in Rome, Italy, and the organization developed a working definition of a sustainable diet to be applied in the context of major dietary analysis:

> *"Sustainable diets are those with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources."* [4]

The Mediterranean diet offers a model of practice to be applied elsewhere. From production to consumption, the food system in place requires a major reanalysis that opens the scope to consider sustainability and environmental impact alongside nutrition and health.

Materials and Methods

The research process focused primarily on the collection of resources from electronic databases of scientific, peer-reviewed journals. Search terms of significance include: "Mediterranean diet" and "western pattern diet" in conjunction with words related to "sustainability", "climate change", "environmental impact", "health and nutrition", and other like terms. Further information was gathered through assortments of information relevant to the

aforementioned keywords and components. Along with the assembly of academic publications, bibliographies were sieved for relevant articles and reviews to be extracted for usage in this research.

Cultural reviews and historical publications that focus on the influence of the MD in a social context provided a framework for understanding the importance of the diet outside of an environmental and health analysis. While the parameters for searching did not exclude other languages, the majority of research comes from English publications. The main criteria for examination include any studies on the two diets that display associations between the core aspects of the diet and overarching environmental impact as well as health and nutritional effects. Cardiovascular disease, CVD, along with cancer were chosen as the primary concerns for a health comparison. These main categories are often the focal points of dietary studies as CVD is the leading cause of death globally and the incidence of cancer is quickly rising.

There are not many existing studies aiming to identify transferable components of the MD, though this area of research is growing. Non-governmental organizations, nonprofits, and other professional organizations provide idealistic goals for introducing and adapting specific aspects of a sustainable diet. For example, community-based organizations working to provide easy access to healthy foods often publish guideline reports for citizens to use.

The Mediterranean Diet

The Mediterranean Diet, MD, is a dietary pattern that originates from the lifestyles and consumption patterns of the people and cultures of the Mediterranean region. This traditional pattern reigned in the olive tree regions of the Mediterranean as the dominant pattern of eating up until the 1960’s when a globalized food system began to take over. However, many communities

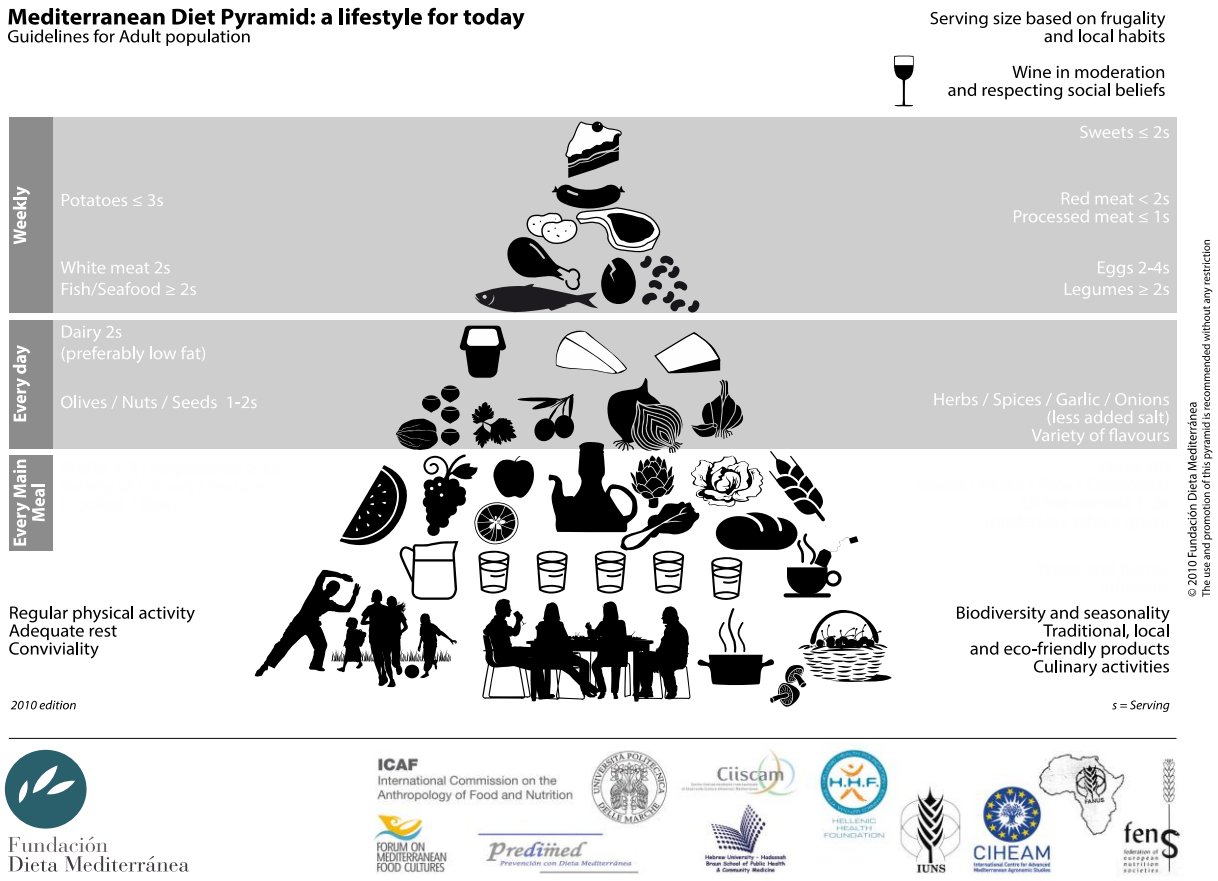
in this region uphold the core elements of the dietary pattern. Countries such as Italy, Spain, France, and Greece exemplify these components and a deep-rooted history helps to keep the diet alive. In the context of academic study, the MD has become a source of inspiration due to its purported health benefits, low environmental impact, promotion of biodiversity, high cultural value, and positive local economic returns, among many other listed benefits. For these reasons it is considered to be one of the healthiest and most sustainable diets in the world [1, 2, 4, 9, 11, 15].

The MD is characterized by a relatively high consumption rate of total fat, mainly from olive oil, though it is low in saturated fat. Diversity allows for richness in nutrients, antioxidant compounds, bioactive elements, dietary fiber, and an overall low glycemic index [1, 11]. Studies show that these listed elements contribute to significant health benefits [1, 4, 11]. The nature of the diet promotes consumption patterns of seasonal produce that is sourced locally and is full of biodiversity.

With many countries providing guidelines for healthy eating, proponents of the Mediterranean diet have created pyramids to mimic the United States Department of Agriculture's visual cue for healthy eating. Figure 1 shows the elements of the MD. This figure was designed by the Fundación Dieta Mediterránea, an organization in Spain dedicated to the research and promotion of the MD. The pyramid establishes daily, weekly, and occasional dietary guidelines that help consumers follow a healthy, balanced diet. Experts in various fields of study, such as nutrition, agriculture, anthropology, sociology, and environmental sciences, have collaborated to design this pyramid. It covers the main, commonly recognized food groups while implementing elements that distinguish the MD. Further, the pyramid introduces lifestyle essentials that help contribute to the overall health of the communities that practice the MD.

Regular physical activity, adequate rest, and conviviality are indispensable factors to the lifestyle aspect of the diet.

Figure 1. The Mediterranean Diet Pyramid



This pyramid, however, is not designed to simply prioritize certain food groups over others, but to also take into consideration how food is selected, prepared, and ultimately eaten. While the MD does emphasize foods that are in season, a wide range of diversity allows for variety. This component, biodiversity, is fully supported by the recommendations for every meal. Plant-based foods are at the base of the pyramid, meaning the three daily meals should consist of cereals, vegetables, and fruits. Cereals call for one to two servings per meal of mainly whole grain products. Vegetables are often consumed at lunch and dinner with more than two servings

per meal. Fruit should be consumed at lunch and dinner as well, though usually as dessert according to common practice. It is important to implement a variety of colors, textures, size, and shape when choosing fruits and vegetables as this diversity provides various antioxidants, compounds, and nutrients [1, 4, 11].

Daily intake also calls for plenty of water, as proper hydration is necessary to maintain equilibrium for many of the body's processes. Herbal teas, broths, and even coffee are included in daily consumption, but the MD does not include sugary drinks, such as soda. Dairy products are considered to be elements of a balanced, every day diet, though these should take the form of low-fat yogurts, cheese, and other fermented dairy products. Though dairy products are a source of saturated fat, olive oil should be the primary source of dietary lipids. It can be used for cooking or simply for flavoring. A wide variety of herbs and spices can improve flavor and palatability as a compliment to olive oil. Tree nuts and seeds are a healthy snack to be consumed in reasonable portions throughout the day as they are a great source of lipids, vitamins, minerals, protein, and fiber [1]. Finally, wine and other fermented alcoholic beverages during meals is recommended every day, though moderation is key. Red wine is generally the choice for MD consumers as studies suggest that resveratrol, a polyphenol compound, has many antioxidant properties [1, 11]. Recommended amounts are one glass a day for women and two glasses a day for men.

The main source of protein for the MD is plant-based, though animal sources are sometimes included. Fish is suggested as two or more servings per week, but it is important to note that this region has easy access to an extremely fruitful sea. White meat can be consumed twice a week and finally, two to four servings of eggs are recommended. Red meat, on the other hand, is consumed far less often, generally only a couple times a month. Looser

recommendations allow for once a week. The key difference in red meat consumption in the MD when compared to typical cuts in the U.S. is that portion sizes are significantly smaller, usually around only 4 ounces. The last tier of the pyramid is sweets, which suggests less than two servings per week. Sweets should be saved for special occasions and if possible, should be home baked goods.

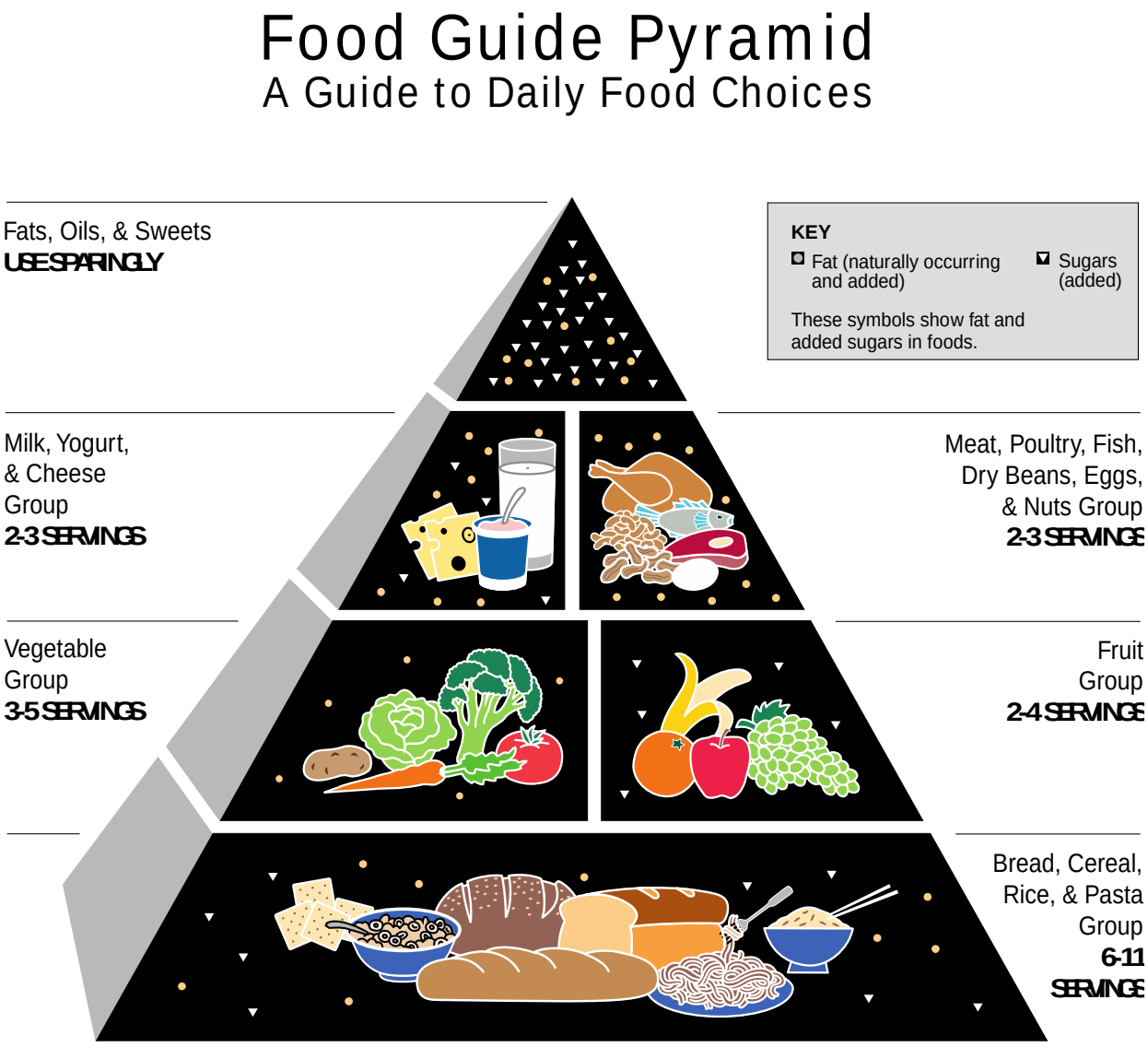
The Western Pattern Diet

The Western Pattern Diet, WPD, is a modern dietary pattern that stems from the major lifestyle changes and restructuring of society post-industrial revolution. It is characterized by high consumption rates of red meat, processed foods, refined sugars, high trans-fat, and minimal intake of fruits and vegetables [3, 6, 15, 21]. The WPD is interchangeably called the Standard American Diet as the United States helped create this globalized system.

The United States Department of Agriculture regularly produces recommendations for Americans to follow that both meet nutritional requirements and encourage an overall healthy pattern of eating [17]. The most well-known symbol of these guidelines is the dietary pyramid, released in 1992, and it lists a few main food categories; namely fats, dairy, protein, vegetables, fruits, and grains. Figure 2 breaks down these categories with the most consumed at the base the least consumed at the top. Notice that these suggestions are on a daily basis and provide little context as to the specifics of healthy choices. Fats, oils, and sweets are in the same group and suggested sparingly, though the types of oils (i.e. trans fats, saturated fats, etc.) are not specified. Both the dairy and protein groups suggest two to three servings a day. Vegetables and fruits occupy the same tier on the pyramid, but the suggestion for servings is different: three to five for vegetables and two to four for fruits. Finally, the base group is designated to grains, with six to

eleven servings suggested daily. Despite there being fundamental health disparities between certain types of grain, most notably bleached flour versus whole wheat, there is no clarity for this category.

Figure 2. The United States Department of Agriculture Food Guide Pyramid (1992).

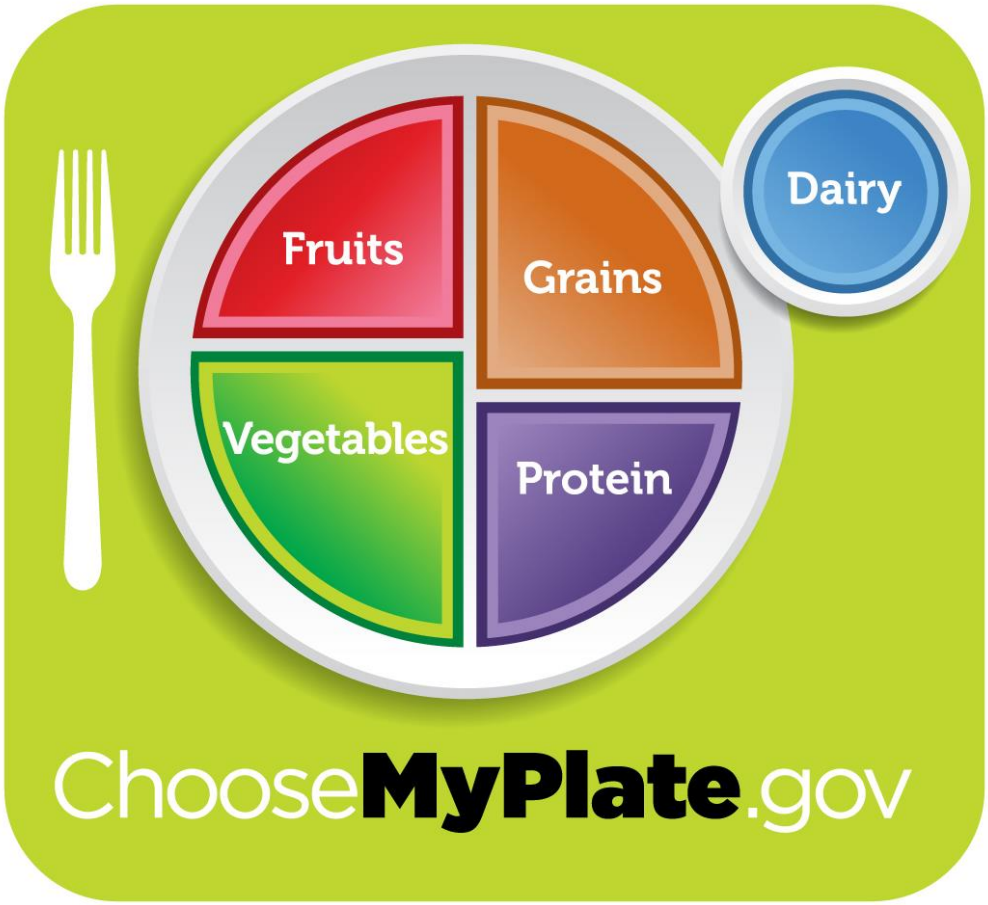


Source: U.S. Department of Agriculture/U.S. Department of Health and Human Services

In order to provide transparency in these suggestions and to create a more interactive guidelines report, the USDA transitioned to MyPlate in 2011. This graphic, figure 3, restructures the food groups into five distinct categories: fruits, vegetables, grains, protein, and dairy. The

proportions are proposed in a structured manner similar to a pie graph with the size of each group acting as the fraction of each meal. The purpose of this transition was to create a better visual for consumers and a more interactive, personal approach. However, in order to access more thorough information regarding safe, healthy choices, consumers must access the internet and a specific online government domain.

Figure 3. The United States Department of Agriculture Choose MyPlate (2011).



Source: USDA Center for Nutrition Policy and Promotion.

The United States Department of Agriculture in conjunction with the United States Department of Health & Human Services releases dietary guidelines reports on five-year increments. These reports act as official government publications for the promotion of health,

nutrition, and chronic disease prevention. The most recent report, 2015-2020 guidelines, notes that dietary intakes compared to recommendations show that a large percentage of the American population is missing the mark [17, 19]. More than 80% of the U.S. population above 1 year old is not consuming enough vegetables. Roughly 75% is below recommendations for fruit, as well. When it comes to added sugars and saturated fats, around 70% is overconsuming. Perhaps the most alarming statistic is that 90% of the population is consuming more than a recommended amount of sodium. Overall, only 4% of Americans are regularly meeting dietary guidelines [12, 17]. Clearly the dietary patterns of the American people require significant change.

A Health Comparison

The Seven Countries Study that took place in the mid-20th century was the first significant study published that asserted the major health benefits of the Mediterranean diet [9]. Since then, numerous studies and rigorous scientific review has corroborated the claims of the MD's health benefits. The foods typically consumed in this dietary pattern contribute protective effects on cardiovascular disease and also aid in counteracting a number of chronic diseases [15]. The consumption patterns of the MD provide diverse foods that are associated with a reduced possibility of developing various cancers, such as stomach, liver, colorectal, and pancreas [1, 4, 15]. Note that the relationship between these two diets and the health effects are not always causal, rather associations. For example, olive oil will not prevent an individual from developing CVD, instead the consumption of healthier fats reduces the risk of development.

With the expansion of technological capabilities, researchers are able to identify specific components to these foods and their principal nutritional qualities. Individuals that follow the MD better fulfill their nutritional requirements than those of the WPD [1, 4, 11]. Long-term

adherence to this diet is ultimately associated with a healthier body weight, reduced rates of obesity, lower incidence of metabolic syndrome and type 2 diabetes, a delay in cognitive decline, and an overall improved quality of life [1, 2, 3, 4, 11]. When considering these benefits, many doctors suggest this diet as a cost-effective way to treat existing CVD, as well as other diseases, in their patients [3, 4].

The WPD is generally associated with a higher risk of CVD, cancer, obesity, and other commonly recognized diseases of modern western civilization [3, 9, 21]. A diet high in processed foods, refined sugars, and high intake of meat is linked to the aforementioned diseases becoming more prevalent in society. Though overall public health is improving, consumers of this diet are comparatively less healthy than those of the MD [1, 3]. One study traced the origins of the WPD and how its components interact with key nutritional components to the biology of the human body [3]. The WPD has fundamentally altered seven vital components to ancestral hominin diets, and this conflict is suggested to play a role in many of the underlying diseases that plague western civilization [3, 21]. In other words, the human diet has changed so drastically in such a short time that the body has not been able to adapt, thus resulting in a higher incidence of diseases that would otherwise be a rarity. In the U.S. and most other Western countries, chronic diseases related to diet are the single largest cause of morbidity and mortality [3, 16, 19, 21, 22].

An Environmental Comparison

There are numerous studies to suggest the major environmental benefits of adherence to the MD [1, 2, 4, 15]. The heart of the MD is the surrounding environment. The core of the diet encourages a wide variety of foods, seasonal consumption, local sourcing, and an overall protection of the environment so to ensure that the consumption patterns can carry on. The rich

cultural histories and traditions of MD communities are intimately tied to the land. Sustainability is the cornerstone to the Mediterranean diet.

The main reason that the MD consistently ranks higher than other diets, especially the WPD, is because it is a largely plant based diet with a lower consumption of animal products [2, 4, 15]. In a Spanish study, the Mediterranean diet was compared to a typical Spanish diet and the standard Western Pattern diet through an environmental lens [15]. Four main environmental pressures were addressed: agricultural land use, energy consumption, water consumption, and greenhouse gas emissions. These four footprints are regularly used in environmental analyses across many areas of study. The results of this study concluded that the MD has a lower footprint in all four pressures than the Spanish diet and a significantly lower footprint than the WPD [15]. Other research suggests that a transition to the MD will drastically reduce the human environmental footprint [2, 4, 12]. A full-scale transformation of the global food system is now identified as a key component to combatting the threats to humanity posed by climate change.

While the MD would substantially reduce the footprint of all four key factors, the WPD would increase the overall footprint in all four categories [15]. This is mainly due to the high consumption of animal products. Livestock require a considerable amount of resources, from water to land, and the environmental impact of livestock is significant. Numerous studies consider the meat industry to be a major contributor to climate change, particularly due to cattle [5, 10, 15, 20]. Cows are ruminant creatures, meaning they derive key nutrients from plants by fermenting the material in the stomach. The byproduct of this is methane in their flatulence. While the sheer volume of gas being released is not equal to that of automobiles, the critical element is that methane is 25 times more powerful at trapping in atmospheric heat than carbon dioxide [5, 20]. Though meat is the main factor in why the WPD is considerably worse for the

environment, the entire system ignores sustainability as a measure of a quality diet. In short, the MD encourages sustainability and responsible environmental stewardship while the WPD largely ignores the impact.

The State of Nebraska

According to U.S. Census data, estimates as of July 1, 2018 list the state population around 1.929 million people [14]. With a large percentage being concentrated around metropolitan areas, namely Omaha and Lincoln, the population per square mile was estimated to be 23.8. The sparse population of the state leaves the majority of the land uninhabited, though not unused. Farms and ranches in Nebraska occupy 45.2 million acres, 91% of the state's total land area [13].

Agriculture is the driving economic force in Nebraska, accounting for over $21.5 billion generated in 2016, 6% of the U.S. economy [13, 18]. The geography of the state is the primary reason for its agricultural fitness. The state experiences a change in elevation from west to east of more than 5,000 feet, creating a climate gradient that allows for a wide variety of crops. Soil types vary, as well, zoning areas for certain uses. Further, the majority of the state sits atop the High Plains Aquifer, one of the largest in the world. For these reasons, and others unattributed, Nebraska is one of the largest agriculture economies in the world by total land area [13. 18].

Despite its high functionality, the state generally sticks to the same principle crops [13]. Corn and cattle are the two largest crop commodities with Nebraska, as spectacled by the two monikers, "The Cornhusker State" and "The Beef State." The state boasts an all cattle and calves count of 6.8 million head [13, 18]. In 2017 the commercial red meat production surpassed 8.1 billion pounds [13, 18]. Corn production for 2017 was noted to be 9.55 million acres, of which

9.3 million were harvested [13, 18]. While this seems like a substantial amount, roughly one-third is for ethanol production while another third goes toward feeding animals [13]. The remaining corn is used for human consumption, biofuels, alcohol, inedible products, and more.

Table 1. Comparing Health Statistics of Cardiovascular Disease and Cancer for Nebraska, United States, and the World.

Prevalence of Risk Factors for Adults 2016	Nebraska	United States	World
Obesity	32%	29.9%	13%
High Cholesterol	35.1%	36.3%	39%
High Blood Pressure	29.9%	30.9%	22.1%*
Diabetes	8.8%	10.5%	8.5%
Stroke (% of CVD deaths)	17%	17.6%	35.8%
Cancer (diagnoses per 100,000 people)	458*	438*	200.6*

*State, national, and global reports for certain risk factors are not always published in the same year. Data is pulled from reports between 2008-2018. Incidence reflects reports, though data may be missing due to differences in healthcare systems between countries. [7, 8, 14, 16, 19, 22]

Table 1 compares the prevalence of cardiovascular disease, as well as cancer, for Nebraska, the United States, and the world. By national measure, Nebraska does not stand out in regard to cardiovascular disease. The prevalence of diabetes, high blood pressure, and high cholesterol are slightly lower than the national average, making comparisons insignificant. The obesity rate is slightly higher, again by such an insignificant measure that the difference is inconsequential for major argumentative purposes. The age-adjusted incidence of all cancer sites in Nebraska is 458 per 100,000 people compared to the USA rate of 438 per 100,000 people. Of these two major health categories, cardiovascular disease and cancer, CVD ranks first in mortality rates accounting for 28.3% of deaths in 2016 in Nebraska while cancer ranks second [14, 19]. After these two categories, no single cause of death exceeds the 10% mark [14, 19]. Despite these major health statistics being on par with national averages, it is important to

remember that the United States has relatively high incidence and mortality rates as a result of CVD when evaluated to comparable country averages. Note that data collection procedures vary by country, therefore not all can be reported to have consistent accuracy across the board.

A Practical Application: transferrable components

Since the Mediterranean region is a distinct climate zone boasting extremely concentrated biodiversity, identifying transferrable components is not a simple task. However, there are overarching themes to the MD that can be applied elsewhere. One study identified these components to be transferred to non-Mediterranean countries with the U.S. being the focal point [11]. The conclusion is that it is possible, but it requires numerous changes in dietary habits. This transferability allows for flexibility but demands that traditional elements remain in place. For example, recently caught octopus is not available in Nebraska so substituting for other sources of protein are acceptable. However, elements that are in opposition, like the consumption of highly processed meats, do not adhere to the traditional components of the MD and are therefore not a transferrable factor.

The larger themes help to establish a framework for adopting aspects of the Mediterranean diet. This does not necessarily require an immediate overhaul of the food system and agriculture industry, but an overall dietary shift will ultimately lead to a more productive and sustainable system. First, it is important to preserve cultural elements that are already in place. This does not mean imparting cultural traditions of the people of Crete, rather consumers should embrace and preserve their own cultures. With these cultural components come the lifestyle aspects that help define the MD. These may include cooking with family and friends, socializing

over a meal, and adopting other beneficial elements of a healthy lifestyle. Nebraska prides itself on many of the same lifestyle elements, such as spending time in the company of others.

The most important theme surrounds support for the local environment. Considering Nebraska already has a well-established agriculture industry and many laws in place to protect the environment, transitioning towards a more eco-centric food system should not be a challenge. This would require seasonality, biodiversity, environmentally friendly practices, and sourcing food locally. However, consumers of the WPD do not necessarily recognize their dietary pattern, just as consumers of the MD do not recognize theirs. Therefore, it is important to breakdown and highlight direct changes to be made. Table 2 identifies these changes and shows how to incorporate the MD.

Table 2. Incorporating the Mediterranean Diet

Mediterranean Diet	**Western Diet**	**Incorporating the MD**
Olive oil	Solid fats; butter, cream cheese. Cooking oils; soybean, canola, corn	Extra virgin olive oil. Consume with vegetables, salad, sautés. Use spices and herbs for flavor
Vegetables	Starchy vegetables more than others. Minimal consumption	Always have vegetables for lunch and dinner, often as main dish. >2 servings a day, some raw
Fruits	Fruit products with added sugar. Minimal consumption	Fresh, raw fruits as desserts. >3 servings a day, variety
Whole grains; Bread	White refined flour, processed cereals, high caloric bread	Whole grain bread, pasta, rice, and flour. Try homemade
Legumes	High sodium in canned products. Minimal consumption	>3 servings a week, variety of beans, lentils, chickpeas, etc.
Seafood; Fish	Lack of variety, expensive Minimal consumption	>1 serving per week white fish, >2 fatty fish and shellfish

Meat; Poultry	Red meat consumed regularly, processed, large portions, daily	Choose lean poultry. Moderate portion sizes (3-4 oz.) Red meat 1-3 servings per month
Dairy; Yogurt and cheese	Various and abundant amounts of dairy; milk, processed cheese, ice cream, milkshakes	Natural yogurt (add nuts and fruit), avoid ice cream, small portions of fresh/cured cheese
Nuts and olives	Butter, margarine, ketchup, mayonnaise, cream sauce, dressings	Primary fat from EVO, >3 servings nuts a week; walnuts, almonds, hazelnuts, etc.
Homemade baked goods	Industrial, store-bought goods, sugary desserts	Occasionally bake at home using olive oil. Consume on occasion
Wine	Beer, liquor, sugary drinks; heavy binge drinking	Replace with wine (red.) Men 2 glasses a day, women 1

*edited and condensed from *Transferability of the Mediterranean Diet to Non-Mediterranean Countries. What Is and What Is Not the Mediterranean Diet* [11]

Discussion

The Mediterranean diet can take on a very important role in transforming the current food system of Nebraska into a more sustainable structure. Communities that currently follow this dietary model are aware of the sociocultural, health, and environmental benefits to its core components. While the global spread of the Western Pattern Diet is taking hold in regions traditionally beholden to the MD, various efforts are in place to combat the negative effects of this unsustainable and unhealthy system. This has sparked a growing interest in spreading the MD as a new model of sustainability.

The Mediterranean diet is an increasingly researched diet for many reasons. It's initial introduction and recognition from the Seven Countries Study highlighted its significance as a healthy diet, though it has recently entered the discussion of sustainability. More research related to practical application of the MD to Nebraska is needed, especially in regard to its effectiveness, economic impact, and ease of transferability. Nebraska is already experiencing shifts in the

agricultural sector, some of which have been taking place for decades [13]. However, there are few largescale studies conducted so far on the environmental impact of just Nebraska's agriculture. While researchers can infer data based on generalized studies from locations around the world, each case is distinct and comes with multiple variables. Still, general components of transferability can be identified. There are a few key components that can be applied in a practical manner to the state of Nebraska, particularly in regard to dietary and lifestyle changes on the individual level. The entire food system should eventually be compromised to better incorporate a sustainability measure.

Conclusion

The Mediterranean Diet is noticeably different than the Western Pattern Diet in that it is a largely plant-based diet that promotes diverse consumption. It shows significantly higher health benefits than the Western Pattern Diet and exhibits a substantially lower impact on the environment. A shift from the current pattern towards the Mediterranean pattern would be beneficial to individual health and larger environmental issues. With studies linking a reduction in risk for both CVD and cancer, as well as other diseases, Nebraskans can improve their overall health by moving towards a healthier diet. Further, a transition is both environmentally friendly and attainable, given Nebraska's geography and current agriculture industry. A massive dietary shift will change the agriculture industry. Land can be repurposed for other uses that can both provide a variety of foods and promote better environmental stewardship.

A few tangent studies can be recommended based on the findings and conclusions in this report. First, it is important to recognize and evaluate the economic impact of a changing agriculture system in Nebraska. With the majority of the state economy being based in

agriculture, any minor change can have an effect on state, local, national, and international markets. Second, a widescale environmental assessment of each of the crops is necessary. Current crop yield should be analyzed for their environmental footprint to determine areas to target. This, in part with the MD transferability, should lead to studies on alternative crops to be grown in place of previously farmed commodities. Finally, a sociological study is suggested to measure the public opinion on a transition towards a more healthy and sustainable diet. With a large percentage of Nebraska's population working in the agriculture sector, it is necessary to understand their opinions on a potential shift.

With few studies published analyzing the transferability of the Mediterranean diet, this study offers insight into how the MD can be applied to specific areas. By transitioning to a more sustainable diet, Nebraska would make a significant contribution to improving both the health of its citizens and the global environment.

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